

## SECTION 1500 - INSPECTION OF LAND DEVELOPMENT

### PART 1 - GENERAL

- 1.01 SCOPE:** This section covers third party inspection of developer-installed improvements to be accepted for public maintenance. Topics included are inspector and laboratory qualifications, responsibility for cost of inspection, reporting requirements, pavement mix design, required tests and inspections, remedial tests, corrective actions and extended maintenance bonds.
- 1.02 APPLICABILITY:** These minimum inspection requirements apply to all sanitary sewer, storm sewer, and pavements built by private parties with the intent to dedicate such facilities to the Unified Government for ownership and maintenance. Also covered are all curb, gutter and sidewalk located in public rights-of-way built as part of land development. Construction not subject to these requirements are: driveway installation and repair of curb or walk on previously developed lots, repairs by franchised utilities and projects administered by the Unified Government Public Works Department and the Board of Public Utilities.
- 1.03 RELATED WORK:** Refer to the following sections for related work:
- |                                   |                                           |
|-----------------------------------|-------------------------------------------|
| Roadway Embankment                | Sec 2000 Earthwork                        |
| Utility Trench Backfill           | Sec 2100 Trenching and Tunneling          |
| Subgrade Preparation              | Sec 2200 Pavement Removal & Subgrade Prep |
| Asphalt Pavement Placement        | Sec 3100 Asphalt Paving                   |
| Pavement Trueness Test Criteria   | Sec 3200 Asphalt Pavement Trueness        |
| Curbs, Walk and Concrete Pavement | Sec 4100 Concrete Pavement and Flatwork   |
| Manholes                          | Sec 5000 Manhole Construction             |
| Sanitary Sewer                    | Sec 5100 Sanitary Sewer Main              |
| Storm Sewer                       | Sec 5200 Storm Sewer                      |
- 1.04 COUNTY ENGINEER:** Throughout this section County Engineer shall mean the Unified Government County Engineer or his designee.
- 1.05 RESPONSIBILITY FOR COSTS:** The developer of the property will pay costs of inspection except the Unified Government will pay cost of the first TV inspection of sanitary sewer lines and storm sewer lines. The developer will pay cost of re-televising lines that fail TV inspection.
- 1.06 CONSTRUCTION ENGINEER:** A professional engineer licensed in the State of Kansas, experienced in civil site design and construction, whose relationship to the Owner is that of independent contractor, and who is familiar with the design. Construction Engineer may be an employee of the inspection firm or may be independent of it. Proposed Construction Engineer and all changes in Construction Engineers shall be subject to the approval of the County Engineer.
- 1.07 INSPECTION FIRM:** Inspection firm shall be either an independent civil engineering firm with principals as licensed professional engineers in the State of Kansas or a materials testing firm meeting the laboratory qualification of this specification. Construction inspection services shall constitute a regular and substantial part of the inspection firm's business. Proposed inspection firm and all changes in inspection firms shall be subject to the approval of the County Engineer.

- 1.08 FIELD INSPECTOR:** Person actually performing the inspections in the field shall have at least one of the following registrations or certifications:
- A. Professional engineer licensed in the State of Kansas or EIT licensed in the State of Kansas acting under the supervision of a licensed professional engineer,
  - B. CIT certification from the Kansas Department of Transportation in soils, asphalt and concrete,
  - C. NICET level one certification in soils, asphalt and concrete.
- 1.09 LABORATORY QUALIFICATIONS:** Tests shall be conducted by an independent construction materials testing laboratory certified in soils, asphalt and concrete by AASHTO or A2LA, and subject to approval by the County Engineer. The laboratory shall have the staff, equipment, qualifications, and experience to perform the tests in accordance with the specified standards. Laboratory may be part of the inspection firm or may be independent of it.
- 1.10 COUNTY ENGINEER'S APPROVAL OF CONSTRUCTION OBSERVERS:** At any time during the construction of the development or review of the construction, the County Engineer may disqualify the Construction Engineer, the inspection firm, the field inspector, or the laboratory based on failure to demonstrate qualifications, or upon failure to provide timely inspection, or upon discovery of a misrepresentation by the Construction Engineer, the inspection firm, the field inspector or the laboratory in the report prepared for this or any other development in Kansas City, Kansas. In the event of disqualification after the start of the project, all inspection performed by the disqualified firm or individual shall be considered null and void; and the work shall be inspected by alternate means or the remedial inspections and extended maintenance bond provisions shall apply.
- 1.11 MIX DESIGN:** Both paving contractor and inspection firm shall review and indicate by their signatures that mix designs for asphalt and concrete meet the minimum construction standards. Mix designs shall be tested by a laboratory independent of the asphalt supplier and shall have been prepared within 12 months prior to construction.
- 1.12 CONSTRUCTION STANDARDS:** Construction shall conform to the Unified Government's minimum construction standards printed as "Technical Provisions and Standard Drawings for Roads and Sewers". Copies are available at the office of the County Engineer and the Unified Government's website. Design and construction shall also conform to the separation and protection standards of the Kansas Department of Health and Environment.
- 1.13 MAINTENANCE BOND:** Prior to the Unified Government acceptance of private development construction, a single performance and maintenance bond from a surety company authorized to do business in the State of Kansas, as Surety, shall be submitted to the County Engineer. Amount of maintenance bond shall be 100 percent of construction cost. Bond shall indemnify the Unified Government of Wyandotte County/Kansas City Kansas for losses arising from defective materials and installation during the term of the bond. Process agent for the Surety must be named and address provided: Process agent must be a resident of the State of Kansas. Terms and conditions shall be as printed on *Attachment B* Maintenance Bond form following this section.

- 1.14 EXTENDED MAINTENANCE BOND:** Where required due to failure to inspect, surety for extended maintenance shall consist of some combination of the following:
- A. Bond equal to the estimated reconstruction costs from a surety company authorized to do business in the State of Kansas;
  - B. Lien against unencumbered real property located in the State of Kansas whose appraised value is equal to the value of the estimated reconstruction costs;
  - C. Cash or cash equivalents equal to the value of the estimated reconstruction costs to be held in escrow by an escrow company located in Wyandotte County.
- 1.15 OTHER ENFORCEMENT:** No certificate of occupancy for any structure in the development will be issued until both the Construction Engineer's certification and a complete inspection firm's report have been reviewed and approved by the County Engineer and all corrective actions have been completed.
- 1.16 REPAIR OF PAVEMENT CORES:** Pavement cores shall be repaired by the paving contractor and observed by the inspection firm. Cores in both concrete and asphalt pavements shall be filled full depth with street pavement mix Portland cement concrete. Mix shall be rodded for consolidation, struck off flush with pavement and cured with a curing compound.

## **PART 2 - PRODUCTS**

Not used

## **PART 3 - EXECUTION**

- 3.01 CONSTRUCTION ENGINEER'S RESPONSIBILITY:** Construction Engineer shall:
- A. Be familiar with the design and design intent of the proposed construction,
  - B. Review adequacy of construction staking and take relative measurements of installed features,
  - C. Review, approve and record minor deviations from the design,
  - D. Review, correct and deliver to the Unified Government sanitary and storm sewer record drawings,
  - E. Observe sewer and manhole tightness tests. After pipe passes tightness tests, notify the County Engineer that the system is ready for TV inspection. Review TV inspection report; propose corrective actions to County Engineer for approval and to direct corrections.
  - F. Conduct prepaving inspection to accept street width, subgrade elevation and cross slope, curb dimensions, and confirm manhole and valve box adjustments.

- G. Conduct paving inspection or review inspection firm's logs of paving inspection to confirm pavement thickness.
- H. Observe pavement trueness tests for arterial and collector roads. Observe water ponding depths on all pavements with minimum slope. See Part 1 for reference to pavement trueness testing criteria and corrective action.
- I. Review inspection firm's report for uncorrected deficiencies; propose corrective actions to County Engineer for review and direct corrections.
- J. Complete and sign the following compliance statement. Proposed amendments to the compliance statements shall be explained in writing and are subject to review of the County Engineer.

"Based on familiarity with the design concept and requirements of the Unified Government, on site observations, review of construction staking by others and measurements made personally, review of the inspection firm's report, and on prior review and approval of design deviations all conducted by me or by my qualified staff, it is my professional opinion that for the development known as Name of Development:

- A. Corrective actions for deficiencies listed in the inspection firm's report have been taken as directed by the County Engineer, documentation is attached.
- B. Deviations from plan deliver the intended system performance, deviations are marked on record drawings; one copy of the street, storm sewer, and sanitary sewer record drawings has been submitted with an approved digital format to the County Engineer, one copy of the street and storm sewer record drawings has been submitted on Mylar to the County Engineer.
- C. Sewers and manholes meet tightness requirements, lines have been televised by Unified Government and passed, and reports are attached.
- D. The installed locations of public improvements are in substantial conformance to the construction plans; road widths are within 2 inches of plan dimension; manhole covers and valve boxes are adjusted to the grade and cross slope of the street; collector and arterial roads meet pavement trueness standards; water ponding depth is within specified tolerance; curb, walk and pavement dimensions are within tolerance; concrete joints are located, prepared, and sealed within tolerance; and all disturbed survey monuments are re-established.
- E. All exceptions to the forgoing location, dimension and tolerance statements are listed as follows:

List exceptions

Signature of Construction Engineer

Typed name

P.E. seal

Attachments: Record Drawings  
Tightness test results  
TV reports”

**3.02 INSPECTION FIRM’S REPORT:** The inspection firm shall submit a final inspection report to the County Engineer and the Construction Engineer. The report shall consist of a compliance statement, a list of uncorrected deficiencies, a statement identifying what if any items are required to have extended maintenance bonds, inspector’s logs documenting all site visits, test results, and mix designs bearing acceptance signatures of both the paving contractor and the inspecting firm.

Compliance statement is printed below. Proposed amendments to the compliance statements shall be explained in writing and are subject to review of the County Engineer.

"Based on the required field observations or remedial tests, along with the required field and laboratory tests, all conducted by me or by my qualified staff, it is my professional opinion that the specific items of work listed below and completed as part of Name of Development meet the minimum construction standards of the Unified Government of Wyandotte County/Kansas City, Kansas or that the uncorrected deficiencies are prominently listed at the front of this report.

1. Roadway embankments were constructed from acceptable material and meet the embankment foundation, placing, and compaction requirements.
2. Roadway subgrades meet the preparation, compaction and moisture content requirements. Subgrade stabilization was either not required or properly executed.
3. Utility trenches and inlet and manhole excavations under and adjacent to pavements were backfilled with the required granular material and the backfill meets the compaction requirements. Utility trenches in non-paved areas were backfilled with acceptable materials and meet the compaction requirements.
4. Concrete curbs gutter and sidewalk meet the mix, thickness, and environmental limits at time of placing, finish, jointing, and curing requirements.
5. Sanitary and storm sewer mains meet the material, bedding, tapping and alignment requirements.
6. Manholes and inlets meet the material, backfill, and compaction requirements.

7. Asphalt job mix complies with the Unified Government Technical Provisions. Asphalt pavements meet the requirements for job mix, total thickness, lift thickness, machine placement requirements, environmental limits and mix temperatures at time of placement, and compaction requirements.
8. Concrete pavements meet mix, base, thickness, reinforcement and doweling, environmental limits, finish, and curing requirements.
9. All items requiring extended maintenance bond due to lack of timely testing are listed prominently at the front of this report.

Signature by principal of inspection firm

Typed name and title

Name of inspection firm

Attachments:           List of uncorrected deficiencies  
                               List of items requiring extended maintenance bonds  
                               Mix design  
                               Inspector's log  
                               Test results"

Extended maintenance bond requirements are included in Part 3 of this Specification.

Inspector's log shall at a minimum show the date and time of each visit on the site, record work observed, note deficiencies and corrective actions taken, and record environmental conditions applicable to the current work effort. The record of each visit shall be initialed by the inspector. Test results shall indicate location of the work sampled, specified limits, and tested values. Failed tests shall be highlighted and annotated to indicate remedial action. The reviewer in the inspection firm shall initial each laboratory report.

**3.03 INSPECTION FIRM'S OBSERVATIONS AND TESTS:** The concurrent and alternate, post-construction observations and inspections listed below shall be conducted by the inspecting firm. Inspection and testing frequencies are listed. Observations shall cover all applicable requirements of the current work. Where daily, but not continuous, observation is required, times of inspection shall vary randomly. Work that fails a concurrent inspection shall be corrected and retested.

- A.     Review job mixes for asphalt and concrete.
- B.     Embankment Foundation: Observation of the prepared embankment foundation shall be made for all roadway fill sections prior to the placement of fill. Verify clearing, topsoil stripping, foundation scarification and compaction. Identify and establish stabilization method for unsuitable foundation material.

No equivalent post-construction tests. See remedial tests and extended maintenance bond, below.

- C.     Roadway Embankment: Daily, but not continuous, observation and compaction testing

shall be made for roadway embankments over 4 feet deep. Observe that soil moisture, lift thickness and compaction effort is appropriate for the soil. Observe embankment is benched where required. Perform in-place moisture and density test at a spacing not to exceed 600 foot per lane and at vertical intervals not to exceed 2 foot.

Alternate post-construction test for embankments: Bore, obtain split tube sample and perform density tests at the required sample spacing. Bores shall be made at the edge of the pavement; or conduct a falling weight deflectometer tests at spacing not to exceed 100 feet along the each lane, alternating wheel paths. Analyze for pavement durability. Pavement durability shall meet or exceed 20 years.

- D. Utility Lines: Continuous observation of sanitary and storm pipe materials and pipe laying procedures shall be made. Continuous observation of sanitary and storm trench backfill shall be made.

Daily, not continuous, observation of other utility trench backfill shall be made.

Observe that appropriate granular material or embankment compaction techniques are used under pavements in all trenches. Where backfill material is AB-3 or excavated material, perform in-place moisture and density of the trench every 300 feet and at vertical intervals not to exceed 2 feet to a depth of 6 feet.

Alternate post-construction test for utility trench backfill in trenches not under pavement: Expose and test backfill of the trench every 300 feet and at vertical intervals not to exceed 2 feet to a depth of 6 feet. Pull mandrel through PVC sewer main to demonstrate less than 3% initial deflection.

Alternate post-construction test for utility trench backfill in trenches under pavement: Conduct falling weight deflectometer tests at spacing not to exceed 100 feet along the centerline of the trench and analyze for pavement durability. Pavement durability shall meet or exceed 20 years. Pull mandrel through PVC sewer main to demonstrate less than 3 percent initial deflection.

- E. Manholes and Inlets: Observation of all manholes and inlets shall be made prior to backfill. Visually inspect invert shape, wall embedment in base, pipe connection, exterior damp proofing, finish quality of barrels and boxes and tops, installation of gaskets, sealant for manhole casting, grout bed for inlet top, and weight and wording of covers.

Alternate post-construction test for manholes and inlets: Conduct hydrostatic test and visual inspection of invert, pipe penetration and cover casting.

- F. Subgrade: Observation of prepared subgrade shall be made within 48 hours of paving operations. If precipitation occurs between the prepaving inspection and paving operations the prepared subgrade shall be observed for standing water or soft spots immediately before paving. Prepaving inspection shall include the following:

1. Proof-roll subgrade with fully loaded dump truck, or equivalent, to

identify soft areas.

2. One nuclear density test at subgrade surface not to exceed 200 feet per lane (not required for city – capital projects).
3. If observation of trenches required to have granular fill was not completed concurrent with the work, expose and test at required spacing.
4. Verify Construction Engineer has made prepaving measurements.

No equivalent post-construction tests. See remedial tests and extended maintenance bond, below.

- G. Asphalt Paving: Continuous observation of paving operations shall be made. For asphalt observe tack coat, color of delivered asphalt, placement and strike off procedure, lift thickness, and compaction effort. Tests on asphalt shall include density tests, stability tests, flow tests, extraction-gradation tests, and 2 nuclear density tests for each 2000 tons cumulative.

No equivalent post-construction tests. See remedial tests and extended maintenance bond, below.

- H Concrete Curb and Walk: Continuous observation of each concrete placement for curb and walk shall be made. Observe form support, form release agent, material placement, fiber reinforcing, shaping, finishing, jointing and application of curing material. Tests shall include examination of ticket for mix design, air content, slump and temperature and one set of 4 cylinders for each 25 cubic yards (500 linear feet of curb or 220 square yards of sidewalk) or fraction thereof for each day's placement. One cylinder shall be broken at 7 days, and two at 28 days with one as reserve. Confirmation that curing material is in place shall be made within 24 hours of the concrete placement.

No equivalent post-construction tests. See remedial tests and extended maintenance bond, below.

- I. Concrete Paving: For concrete observe form support and bond break, placement of dowel baskets and reinforcing, prewetting of subgrade, material placement, strike off and consolidation, finishing, jointing and application of curing membrane. Tests on concrete pavement shall include examination of ticket for mix design; determination of unit weight, air content, slump and temperature; and casting one set of 4 cylinders for each sample lot. A sample lot is the first 25 CY placed and each additional 400 CY or fraction thereof for each day's placement. One cylinder shall be broken at 7 days, and two at 28 days. One cylinder shall be held in reserve.

No equivalent post-construction tests. See remedial tests and extended maintenance bond,



below.

- J. Major Structures: Acceptance sample testing frequencies for Portland Cement Concrete for Bridges and Major structures: one set for approximately every 300 cubic yards concrete or as required for acceptance. Minimum of 1 set per job and class of concrete.

No equivalent post-construction tests. See remedial tests and extended maintenance bond, below.

**3.04 REMEDIAL TESTS AND EXTENDED MAINTENANCE BOND:** If the required inspections, for which no equivalent post-construction tests exist, were not performed during the work the remedial tests and maintenance bond extensions listed below shall apply. The extension of the maintenance bond shall be in addition to the normal length of maintenance bond for new development.

- A. Failure to observe embankment foundation has no remedial action. A one-year extension of maintenance bond shall apply. Amount of extended of maintenance bond shall cover cost of all work.
- B. Failure to observe and test curb and walk placement shall be abated by examination of finish, shape, presence of fiber reinforcing. A two-year extension of maintenance bond shall also apply. Amount of extended maintenance bond shall cover cost of all concrete curb and walk.
- C. Failure to make prepaving inspection or to observe paving operations in asphalt pavements shall be abated by conducting a falling weight deflectometer test at spacing not to exceed 100 feet along the each lane, alternating wheel paths. Analyze for pavement durability. Pavement durability shall meet or exceed 20 years. A two-year extension of maintenance bond shall also apply. Amount of extended maintenance bond shall cover cost of all asphalt pavements.
- D. Failure to make prepaving inspection or to observe paving operations in concrete pavements shall be ameliorated by sampling concrete cores at a spacing not to exceed 600 feet per lane, staggered, measuring pavement and base thickness, conducting a compressive strength test on the core, and visually confirming fiber content. Cores shall be replaced with road mix concrete. A two-year extension of the maintenance bond shall also apply. Amount of extended maintenance bond shall cover cost of all concrete pavements.

**3.05 CORRECTIVE ACTION FOR FAILURE OF CONCURRENT TESTS:** If any part of the work fails a concurrent test, the contractor shall take action to correct the failed work and shall adjust methods and materials to avoid additional failures. Appropriate corrective action may include adjustment of forms, lines and grades, removal of rejected material from the job site, adjustment of mixes, postponing work until environmental conditions are favorable, moisture control of soil, tillage and recompaction of soil, stabilization of subgrade with rock or fly ash, identification and sealing of leaks, removal and replacement of work, or other actions as directed

by the Construction Engineer.

- 3.06 CORRECTIVE ACTION FOR FAILURE OF POST-CONSTRUCTION TESTS:** If any part of the work fails a post construction alternative test or post construction remedial test, the Construction Engineer shall propose corrective action for review by the County Engineer. Appropriate corrective actions may include removal and replacement of work, addition of asphalt overlays, diamond grinding for pavement smoothness, lining or spot repair of sewers manholes or inlets, negotiated payment to offset cost of accelerated maintenance and replacement by the Unified Government, or other actions as approved by the County Engineer. KDOT performance price adjustments for pavement thickness and smoothness may be a starting point for price negotiations.

**ATTACHMENTS:**

Attachment 1500-A MAINTENANCE BOND

END OF SECTION 1500

**MAINTENANCE BOND**

KNOW ALL MEN BY THESE PRESENTS:

THAT WE,

\_\_\_\_\_

(Name of Contractor)

as Principal, and

\_\_\_\_\_

(Name of Surety Company)

a corporation duly organized under the laws of the State of \_\_\_\_\_, and authorized to do business in Kansas, as Surety, are held and firmly bound unto the Unified Government of Wyandotte County/Kansas City, Kansas, as Obligee, in the amount of \_\_\_\_\_

Dollars (\$ \_\_\_\_\_), for the payment of the full cost of improvements whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has undertaken, with the approval of the Unified Government, to construct public infrastructure within

\_\_\_\_\_

(Name of Development)

for the purpose of dedication of said infrastructure to the Unified Government.

NOW THEREFORE, if the said Principal shall construct or cause to be constructed and completed the entire improvements in accordance with the Unified Government's current Technical Provisions, and to the lines and grades shown on the plans, all to be done subject to the approval and acceptance of the County Engineer, and shall construct said improvement with such materials and in such manner that the same shall endure without need of any repairs for a period of two years from and after the completion of said improvement and acceptance thereof; and if said improvement shall endure without the need of repairs for the period of two years from and after the completion and acceptance thereof as aforesaid, then the obligation shall be void; otherwise to be in full force and effect.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

**PRINCIPAL:**

**SURETY:**

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Name of Surety)

**(Seal)**

**(Seal)**

**By** \_\_\_\_\_

**By** \_\_\_\_\_

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Title)

**Attorney in Fact**

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Witness)

**Approved:**

\_\_\_\_\_  
(Assistant U.G. Attorney)